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# THE SPHERICAL VACUUM: EMERGENT SPACETIME AND THE RESTORATION OF SYMMETRY THROUGH ENTROPIC ASYMMETRY

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**Abstract**

Current cosmological models suffer from a fundamental reliance on Euclidean manifolds that necessitate "dark" corrections and physical singularities. We propose the Spherical Vacuum Model (SVM), a non-Euclidean framework where the universe is a singular, absolute sphere of infinite energetic potential and zero entropy (S=0). In this paradigm, matter is not an additive substance but a localized negative displacement (a "void") within the vacuum plenum, where the vacuum represents a state of infinite energy and zero entropy. We argue that time, space, and gravity are non-fundamental, emergent properties arising from the distortion of spherical geometry. By redefining mass as a negative displacement of the vacuum and entropy as a measure of geometric fragmentation, we provide a framework where the Golden ratio emerges naturally from packing constraints. By addressing the inconsistencies in the Schwarzschild solution identified by Loinger and the alternative plasma-electric architectures of Scott, we provide a unified zero-sum equation for the cosmos. This model reinterprets "black holes" not as singularities, but as phase transitions back into pure vacuum energy at the Planck scale, addressing inconsistencies in the Schwarzschild solution.

**Keywords**: Spherical Vacuum Model, illusion, geometric fragmentation, negative displacement, symmetry, Golden ratio

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## 1. Introduction

For over a century, theoretical physics has been bifurcated by the "Euclidean construct", the assumption that spacetime is a passive, linear container for events [7]. This assumption forces a mathematical deadlock between general relativity [2] and quantum mechanics. When equations are constrained to a coordinate grid (x,y,x,t), gravity must be treated as a force or a curvature of a fabric.

By treating "flat" or "curved" space as a literal container, we constrain our equations within a secondary coordinate system. We propose a departure toward pure spherical geometry, where the "vacuum" is a perfect, absolute sphere of infinite energetic potential. The universe is modelled as a perfect, absolute sphere of infinite energetic potential. The vacuum state ($\Psi_V$) defines the ground state of the universe as a non-local potential field $\phi$ with absolute spherical symmetry:

$$\Psi_V \Rightarrow \nabla\phi = 0 \qquad S = 0 \qquad E = \infty \tag{1}$$

The classical (x, y, z, t) coordinate system is replaced with a unified radial potential system, where every "point" is a vector $\underline{r}$ representing a radial extension from a singular central potential $U_0$

$$\underline{P}(r, \theta, \phi) = U_o \cdot \underline{r} \tag{2}$$

We posit that this coordinate "fabric" is an illusion. By shifting the foundational basis to pure spherical geometry, we eliminate the need for time and gravity to be independent forces. We propose that the "Universum" is a plenum of perfect symmetry. Reality, as perceived by an observer, is merely the sensory and entropic manifestation of local deviations from this primordial spherical stasis.

## 2. Results and discussion

### 2.1 Entropy and time

To address the ambiguity of the term, we define entropy (S) specifically within the context of information theory and geometric distortion. In the classical view,

entropy is linked strictly to heat flow. In general, it is a measure of the disorder, randomness, or uncertainty within a system. The definition shifts and specifies slightly depending on the field: In classical thermodynamics, it is a state function that quantifies the amount of energy in a physical system that cannot be used to do work. According to the second law of thermodynamics, the total entropy of an isolated system can never decrease over time; it can only remain constant or increase. In statistical thermodynamics, it represents the number of specific microscopic configurations (microstates) that correspond to a system's macroscopic state (macrostate). More possible microstates mean higher entropy. Finally, in information theory it measures the average amount of information produced by a stochastic source of data. Essentially, it quantifies the level of "surprise" or uncertainty in a variable; the more unpredictable a message is, the higher its entropy.

In our SVM framework, we adjust its meaning: here entropy becomes the quantitative measure of geometric deviation (G) or "fragmentation" from the primordial spherical stasis. Therefore, in the SVM, we introduce a technical geometric definition of entropy: as the measure of information loss through geometric deviation. In this context, the ground state is the perfect sphere that represents the highest possible information density where all points are unified (S = 0) and the entropic state is the state when the vacuum is displaced to form matter and the "unity" is fragmented into discrete "quanta." Time is not a dimension but the measurement of the rate of this fragmentation. It is important to bring up the term “energy”. Here, energy (E) and entropy are inverse manifestations of the same geometric potential (inverse duality). This means that the product of energy and entropy is constant for a given geometric volume V:

$$E \cdot S = K \tag{3}$$

From this, when $S \to 0$ (perfect symmetry) then $E \to \infty$ (infinite potential).

The "vacuum" (S = 0) is a state of total symmetry where no distinct "events" can exist. Matter is a localized increase in entropy: a "scab" or "hole" in the vacuum potential. Therefore, mass is defined as a negative displacement in the + vacuum potential and the total energy becomes

$$E_{total} = E_V(+) + E_{mass}(-) \tag{4}$$

As the total energy is a constant of the infinite sphere, we get a zero-sum geometric equation

$$\int_V \quad \Delta\phi dV = 0 \tag{5}$$

We can define a geometric deviation tensor ($G_{\mu\nu}$) that measures the "roughness" or asymmetry of the local vacuum. Time (t) is then not a dimension, but is defined as a secondary scalar derivative of this entropic decay relative to this distortion:

$$\Delta t \equiv \frac{dS}{dG} \tag{6}$$

This definition satisfies the "arrow of time" without requiring a four-dimensional manifold; time is simply the shadow cast by the vacuum's decay into complexity. The past is defined as the high symmetry extreme ($G = 0$) and the future is as the low symmetry extreme ($G \rightarrow \infty$).

The integral is giving the "absolute" time definition over a range of distortions:

$$t = \int \quad \frac{\partial S}{\partial G} dG \tag{7}$$

## 2.2. The emergence of gravity

In this framework, gravity is redefined as a mechanical pressure of the vacuum attempting to restore symmetry. The vacuum pressure gradient labelled as $F_g$ is defined as

$$\underline{F_g} = -\nabla P_V \tag{8}$$

Where $P_V$ is a function of the local density of "holes" (mass). This naturally derives the inverse-square laws as the pressure disturbances across the surface area ($4\pi r^2$) of the spherical distortion - see below.

In this model, therefore, gravity is not a "pull" between masses but an inward push from the high-pressure vacuum (+) into the low-pressure "mass-hole" (-).

We define the vacuum plenum as having an intrinsic pressure $\Pi_\infty$. A mass M is a localized depletion of this pressure. The local pressure $\Pi$(r ) at a distance r from the centre of a mass can be modeled as

$$\Pi(r) = \Pi_\infty \left(1 - \frac{R_S}{r}\right) \tag{9}$$

Where $R_s$ is the "displacement radius" that is proportional to the amount of vacuum displaced by mass.

The $F_g$ force is the gradient of the vacuum pressure acting on the surface are of the spherical distortion:

$$\underline{F_g} = -\oint_A \Pi(r) dA \tag{10}$$

Since the surface area of the vacuum displacement scales as $4\pi r^2$, the pressure gradient must distribute over this area to maintain equilibrium:

$$\nabla\Pi = \frac{\partial\Pi}{\partial r}\underline{r} = \frac{\Pi_\infty R_S}{r^2}\ \underline{r} \tag{11}$$

This confirms that what we perceive as "gravitational pull" is mathematically the radial restoration force of the vacuum density seeking symmetry.

### 2.3. Black holes and singularity

We can define a critical vacuum pressure $\Pi_c$, which represents the maximum tension the "material" geometry can sustain before collapsing back into the vacuum plenum, this threshold is reached at the Planck length (Lp). The local vacuum pressure $\Pi$(r ) from our previous derivation was

$$\Pi(r) = \Pi_\infty \left(1 - \frac{R_S}{r}\right)$$

From this, when r is approaching Lp, the displacement $R_s$ (the "hole") becomes indistinguishable from the surrounding vacuum potential. At this point, the gradient $\nabla\Pi$ becomes non-linear:

$$\lim_{r \to L_P} \nabla \Pi \Rightarrow \infty \tag{12}$$

With these, instead of the density becoming infinite (as in general relativity) the entropy of the system hits a hard floor of zero.

The notion of a gravitational singularity arises from the Schwarzschild solution, but as shown by Angelo Loinger in "*On Black Holes and Gravitational Waves*" [4], the original Schwarzschild article contains no such singularity as the original Schwarzschild solution does not necessitate a point of infinite density. Furthermore, we must acknowledge the "political" nature of black hole theory, often used as a mathematical "fix" for models [1] that fail at extreme scales (see *Exploding a Myth*, [6].

The SVM accepts this view, proposing that at the Planck Limit (Lp) a physical phase transition occurs. In our SVM model, the "black hole" is reclassified as a Planck phase transition. The SVM asserts that the "singularity" (r = 0) is a mathematical failure of the Schwarzschild coordinate system, not a physical reality.

Black holes are modelled as regions where negative potential depletions overlap until they reach the Planck scale, triggering a reversion to vacuum. Here, we model the state of the black hole core as a phase transition. The black hole is the mechanism by which the "debt" of material existence is settled. The total energy flux ($\Psi_{BH}$) of a black hole in this model is:

$$\psi_{BH} = \int_{V_{pANCK}} |M(-) + \Pi(+)| dV (= 0) \tag{13}$$

When the integral equals zero, the "hole" is closed, and the local region of the universe returns to the spherical vacuum state. A black hole is modelled as a region where negative potential depletions overlap until they reach the Planck scale, triggering a reversion to the vacuum.

Mathematically, this is geometric cancellation, where the input is a massive displacement (high entropy, negative potential), the transition is the overlap of displacements at the Planck scale and the output is zero entropy with infinite positive potential ($\Psi_V$). In this context, the singularity is redefined as the point there inverse duality resets:

$E \cdot S = K$ if $S \to 0$ then, $E \to \infty$

At the Planck limit the singularity is resolved as a geometric cancellation. In this model, the black hole is a "pressure leak" where the compressed "negative" mass is being squeezed out by the surrounding "positive" vacuum pressure. As the black hole "heals" the holes in the vacuum, the excess restored energy is pushed outward as pure symmetric potential which we perceive as high-energy radiation.

In standard physics, Hawking radiation [3] is seen as a loss of mass, in the SVM it is the recovery of the vacuum's ground state. We define the restoration flux $\phi_{res}$ as the rate at which the vacuum "heals" the hole created by mass M:

$$\phi_{res} = \frac{d}{dt} V(+) \tag{14}$$

Because the total energy of the system is zero-sum equation (V(+) + M(-)), any increase in the vacuum's symmetric potential must result in a decrease in the absolute value of the negative mass-hole:

$$\frac{dV}{dt} = -\frac{d[M]}{dt} \tag{15}$$

The event horizon is not a point of no return for light, but the boundary layer of the phase transition. We can model the Hawking radiation as, instead of a "thermal evaporation" from a mass, the restored energy leakage from the vacuum or the vacuum overflow ($\phi_{out}$). In other words, the event horizon is where the vacuum's inward push (gravity) meets the material resistance of the mass-hole. We can model the radiation as a result of quantum tunnelling through a pressure gradient.

$$\phi_{out} = \frac{d}{dt}\left(V_{restored} - V_{eq}\right) \tag{16}$$

The P probability of energy escaping the horizon is proportional to the local curvature of the vacuum displacement:

$$P_{rad} \sim exp\left(\frac{\Pi_c}{\nabla \Pi}\right) \tag{17}$$

In small black holes the pressure gradient is sharper, meaning the vacuum "heals" them faster. This explains why smaller black holes radiate more

intensely. On the other hand, large black holes have a flatter gradient, and this leads to a slower restoration of symmetry.

When a phase transition at the core occurs (Planck collapse), the volume of restored vacuum energy can exceed the local geometric capacity of the hole. This results in relativistic jets that can be modelled as a symmetric potential discharge (D):

$$\underline{D} = \eta(\Pi_{core} - \Pi_{vacuum}) \cdot \underline{z} \tag{18}$$

Where $\eta$ is the "conductivity" of the vacuum and z is the axis of the least resistance (usually the rotational poles).

We can now represent the entire life cycle of matter in this model with a single symmetry loop:

1. **Crystallization:** $\mathbb{V}(+) \xrightarrow{\text{Entropy Increase}} M(-)$ (Creation of the "Hole").
2. **Persistence:** Gravity ($\nabla\Pi$) attempts to "push" the hole closed.
3. **Collapse:** $M(-) \xrightarrow{\text{Planck Limit}} \mathbb{V}(+)$ (The Phase Transition).
4. **Return:** $\Phi_{res} \rightarrow$ Restored Vacuum (The debt is settled).

Figure 1. Full life cycle of matter.

The SV model suggests that information is never lost because "information" is simply a specific geometric distortion (G). When the black hole dissolves the distortion, the "information" (the shape of the hole) is simply smoothed back into the infinite potential of the spherical vacuum.

To summarize, in our SVM model, at the Planck limit (Lp), negative displacements (mass) overlap so significantly they undergo geometric cancellation. The system flips back into its most stable state: the vacuum (+). The black hole is a cosmic recycler, returning asymmetric "mass-debt" to the ground state of zero entropy. Instead of a "black hole," we define these regions as symmetry restoration gateways. When mass-density reaches the limit where

the vacuum "holes" overlap (r to Lp) the local entropy approaches a local maximum, triggering a geometric flip. The negative potential of matter is "squeezed out" by the infinite pressure of the surrounding vacuum plenum. As a result, the matter dissolves back into pure, symmetric vacuum energy. The "black hole" is a cosmic recycler, settling the "energy debt" of material existence and returning the region to S = 0. This idea removes the infinite values that plague general relativity.

The general relativity-based model and the SVM differ significantly at numerous points:

| **Feature** | **General relativity** | **SVM** |
|---|---|---|
| Core nature | Singularity (infinite mass) | Phase transition (zero mass) |
| Entropy | Maximum ($S \to \infty$) | Minimum ($S \to 0$) |
| Gravity | Spacetime curvature | Vacuum restoration pressure |
| Energy scale | Crushing weight | Absolute energetic purity |

## 2.4. Dark phenomena

Standard cosmology relies on "dark matter" and "dark energy" to prop up the Big Bang theory. However, critics like Don Scott [5] suggest these are structures used to maintain an absolute truth that may be flawed.

Following the work of Scott, we argue that these phenomena are emergent properties of the vacuum plenum itself. We define the vacuum not as "nothing," but as an infinite positive potential ($\Phi_v$). This plenum possesses an inherent "pressure of Integrity." The "missing mass" in galaxies is reinterpreted as the radial potential gradient of the vacuum. As the vacuum "pushes" inward to close the holes of a galaxy, it creates a tension field that mimics the effects of additional mass. This removes the need for hypothetical unobserved particles.

To make this framework more complete and mathematically sound, we will formalize dark energy not as a "mysterious force" but as the global restoration pressure ($\Pi_G$) of the infinite vacuum plenum. In this model, the "expansion" of

the universe is not the vacuum's energetic effort to smooth out the "material scabs" (galaxies and matter) and return the entire system to absolute spherical symmetry.

We define the vacuum as a state of positive potential, with the ethernet outward pressure. Matter represents negative displacement (voids) that create tension in the field.

The "expansion velocity" ($v_e$) of a point in space is modeled as the rate at which the vacuum recovers volume from these depletions:

$$v_e = \nabla \Pi_G \tag{19}$$

Unlike the standard Hubble constant ($H_D$), which is often treated as a property of space itself, our symmetry restoration constant ($\Lambda_S$) is a measure of the vacuum's "healing rate":

$$\Lambda_S = \frac{\partial V(+)}{\partial M(-)} \tag{20}$$

Standard gravity explains why matter "clumps" (local restoration). Dark energy explains why those clumps move apart (global restoration).

We can model the "Repulsion" between two galaxies ($M_1$, $M_2$) as the vacuum attempting to maximise the symmetry of the region between them. If the vacuum pressure between two masses is higher than the internal pressure of the masses themselves, then

$$F_{ext} = F_{vacuum-push}(+) - F_{vacuum-pull}(0) \tag{21}$$

At cosmological scales, the vacuum plenum pressure ($\Pi_\infty$) dominates:

$$\lim_{d\to\infty} F_{net} \approx \Pi_\infty A_{surface} \tag{22}$$

This results in the observed accelerated expansion, as the infinite vacuum asserts its geometric dominance over the finite "scabs" of matter.

In this framework, the Big Bang was not the creation of space but the initial massive displacement of the perfect vacuum into a state of high entropy. Therefore, this single event is the large symmetry break event.

t = 0 is characterised by the absolute spherical symmetry (S = 0, $E = \infty$) and t > 0 is the "crystallisation" event when the vacuum "breaks" into M(-). In the current era the vacuum is actively "healing" the Big Bang's displacement, which we perceive as dark energy.

As a summary, in our SVM, these "dark particles" are not "missing particles" but geometric restoration pressures. Dark energy is the inherent outward pressure of the infinite vacuum plenum (+) attempting to "smooth out" the material voids (-) and restore spherical integrity and dark matter is the localized tension of the vacuum field accommodating mass-holes, removing the need for auxiliary particles. The "expansion" of the universe is the vacuum's effort to restore total symmetry. This is not a "force" driving space apart, but the vacuum recovering volume from material fragmentation.

## 2.5. Spherical packing

To minimise internal tension (energy loss) and maximise geometric stability during a phase transition, energy must be distributed according to spherical phyllotaxis.

For N points (energy quanta) on the unit sphere, the most stable distribution (the "Fibonacci lattice") is defined by the coordinates

$$z_i = \frac{2i-(N+1)}{N} \tag{23}$$

$$\phi_i = \frac{2\pi i}{\phi} \tag{24}$$

Where $\phi = \frac{1+\sqrt{5}}{2} = 1.618$, that is the Golden ratio.

This framework argues that the Golden ratio is the mathematical "signature" of the vacuum attempting to maintain maximum symmetry while "crystallizing" into matter.

We can define the "symmetry retention" of a system as a function of its packing efficiency:

$$H(G) = \sum_{i=1}^{N} \quad \frac{1}{\left|\underline{r_i}-\underline{r_j}\right|^2} \tag{25}$$

The framework posits that the vacuum naturally settles into a state where H(G) is minimised. Mathematically, the global minimum for this energetic tension on a spherical manifold is only achieved when the angular displacement between points follows the Golden angle:

$$\Psi_{angle} = \frac{160}{\Phi^2} = 137.5 \tag{26}$$

This maintains maximum symmetry during the phase transition from vacuum to mass as this spherical phyllotaxis function guarantees that the distribution of energy "crystallasing" into matter follows the most efficient geometric path.

Therefore, the magic question, "why does the Golden ratio appear from the subatomic to the galactic scale?" can be answered in this framework. In the SVM, it is the inevitable result of spherical packing efficiency. When the high-energy vacuum "crystallizes" into mass, it must distribute that energy to minimize internal tension. The Fibonacci sequence (expressed via spherical phyllotaxis) is the most stable geometric path for a vacuum attempting to maintain maximum symmetry while constrained by material "voids."

## 2.6. Synthesis

The entire model can be summarized by the conservation of symmetry equation. We introduce the universal symmetry equation, which governs the conservation of geometric potential and is based on the the zero-sum geometric potential (**Ω**) defined below:

$$\Omega = \phi_V(+) + \sum_{i=1}^{N} M_i(-) + \int \frac{dS}{dt} dG = 0 \tag{27}$$

Where $\Phi_V(+)$ is the infinite positive potential of the spherical vacuum, $M_i(-)$ is the localized mass-holes (negative displacements or mass) and the third term accounts for the entropic "noise" perceived as time and space.

In the equation, the infinite potential of the vacuum ($\Phi_V(+)$) is always perfectly balanced by the "debts" of the mass and the "noise" of entropic time (third term).

In this framework, the following parameters form the foundation:

| Concept | Representation | Description |
|---|---|---|
| Vacuum | $\Phi(+)$ | Infinite potential, zero-entropy ground state |
| Mass | $\Delta\Phi(-)$ | Localized depletion or "hole" in the vacuum |
| Time | $\frac{dS}{dG}$ | A measurement of geometric deviation (G) from symmetry |
| Gravity | $\nabla P_v$ | Pressure gradient of the vacuum plenum |
| Space | $d(\Delta\Phi_i,\Delta\Phi_j)$ | Relational distance between vacuum displacements |

Equation (27) demonstrates two ideas:

1. Mass is a debt - matter can only exist if there is a corresponding "tension" in the vacuum.
2. Conservation: Energy is never "created"; it is only displaced from the infinite symmetric plenum into asymmetric entropic states.

In general relativity, gravity increases to infinity as distance (r ) approaches zero, creating the "singularity paradox". The SVM predicts a phase transition instead.

In SV, the force of gravity is limited to maximum vacuum pressure. As we approach the Planck length, the "hole" in the vacuum reaches its maximum possible geometric density.

In SVM the gravitational potential is defined as

$$\phi_{SVM}(r) = -\frac{GM}{r}\left(1 - exp(-\frac{r-Lp}{Lp}\right) \quad (28)$$

As the distance r approaches the Lp Plack scale, the gravitational force tends to infinity, while in the SVM it tends to zero (geometric cancellation).

When r = Lp, the term (1-exp(0)) becomes 0. The gravitational "pull" vanishes because the negative displacement (mass) and the positive restoration (vacuum) perfectly overlap. The system undergoes a symmetry flip.

The SVM predicts that at extremely high energy densities (such as the final micro-seconds of a black hole's life or the earliest moments of the Big Bang), gravity should effectively "shut off" of invert. Instead of a crushing point, there should be a symmetry rebound or "Planck bounce". Astronomers could look evidence for this in two phenomena:

1. Hawking radiation spectra: A sudden "spike" in energy as the last of the mass-hole cancels out into pure vacuum potential.
2. Gravitational waves: High-frequency "ringing" signatures that deviate from general relativity predictions as two micro-black holes merge, showing a lack of infinite density.

**3. Conclusions**

The universe is a self-regulating geometric system with an absolute sphere of infinite energy. It began in perfect symmetry with no internal dimensions (due to the lack of discrete points to define distance) and zero entropy, was perturbed into the "illusion" of material existence and linear time, and is now mathematically fated to return to its ground state of zero entropy through the pressure of spherical vacuum. In this framework energy and entropy are reciprocal manifestations of singular geometric potential. Matter is not an existing "thing" added to the universe but a localised negative displacement (a "hole") in the positive vacuum potential. The universe itself is a zero-sum geometric system with no defined dimensions. Furthermore, gravity is not a fundamental force but a mechanical pressure gradient of the high-energy vacuum attempting to "push" a mass-hole closed to restore spherical symmetry.

Time is a secondary measurement of the degree of geometric deviation (G) from the primordial sphere. "The arrow of time" is the derivative of entropy relative to its fragmentation. By removing the concepts of linear time and fundamental gravity, we dissolve the paradox of the singularity. The universe is not a collection of separate parts, but a single, symmetric whole viewed through the fractured lens of material existence.

The SVM resolves the "singularity" by reclassifying it as a phase transition and demystifies "dark" phenomena as geometric restoration pressures. By adopting the technical definitions of entropy and the critiques of the Schwarzschild/Big Bang dogmas provided by Loinger and Scott, we move toward the physics of symmetry restoration.

We are not observers on a stage; we are intrinsic fluctuations within an infinite, symmetric whole. The future of physics lies in mapping the "healing rate" of the vacuum as it pulls the fragmented, entropic world back into the perfect, spherical embrace of the absolute.

| **Phenomenon** | **SVM interpretation** |
|---|---|
| Gravity | $-\nabla P_{v:}$: The pressure of the vacuum "pushing" a hole closed. |
| Charge | Geometric "spin" required to maintain the equilibrium of the distorted sphere. |
| Black hole | A "phase transition" where the hole is fully settled. |
| Matter | A "frozen" or "crystallised" state of vacuum energy. |
| Dark energy | Global vacuum pressure "smoothing" the field. |
| Golden ratio | The inevitable consequence of packing efficiency within spherical constraints. |

In this framework, a black hole is a region where the "negative" mass-holes are packed so tightly that the surrounding "positive" vacuum pressure can no longer hold them apart, leading to a restoration of the original symmetry.

The SVM replaces the "broken" infinities of modern physics with a self-regulating geometric loop. By treating the universe as a sphere seeking its own perfection, we move from a physics of "objects" to a physics of symmetry restoration.

The goal of future inquiry lies in mapping the precise mathematical pathways by which the infinite energy of the vacuum manifests as the finite world.

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